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# The Dynamic Impact of Indexing the Personal Income Tax



Staff Paper

*Ontario*

Ministry of Treasury, Economics and Intergovernmental Affairs  
Taxation and Fiscal Policy Branch





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**The Dynamic Impact  
of Indexing the Personal  
Income Tax**

Ministry of Treasury, Economics and  
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## **Preface**

The purpose of this study is to present a technical analysis of the implications of indexing the personal income tax for inflation. Accurate measurement of the impact of this major change in the tax structure is important both in terms of the effects on taxpayers and the revenue consequences for the provinces and the federal government in the years ahead. The results provided in this study should prove valuable to the long-run financial planning process of governments and should contribute to a better understanding of the new income tax system by Canadians at large.

The first draft of the material in this study was presented at the special meeting of the Continuing Committee of Officials to discuss tax indexing (Ottawa, November 23, 1973). These Ontario estimates constituted the first quantitative evaluation of indexing using up-to-date income tax data reflecting the tax reform measures put into effect in 1972. The original analysis was refined and expanded for the meeting of the Continuing Committee of Officials on January 7, 1974. In co-operation with the other provinces, this research also included estimates of the indexing losses in seven other provinces through to the end of the period of the revenue guarantee (1974-1977).

The study has been prepared under the joint direction of Mr. D. M. Allan and Mr. B. Jones of the Fiscal Policy Division. The research team was headed by Brian Hull and included Harry Newton, Larry Leonard, Nancy Bardecki, Tom Sweeting, Sampson Chan, Rick Temporale, Linda Pesando and Moira Spooner. Assistance in preparation of the data is gratefully acknowledged to the staff of the Operations Research and Statistics Division of Revenue Canada, Taxation, and to Allen Berg of Computer Sciences Ltd.

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January, 1974



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## **Introduction**

In his February 19, 1973 budget, the federal Minister of Finance, the Honourable John Turner, undertook a major structural alteration in the income tax structure designed to offset the automatic increase in tax collections which is generated by inflation. The tax reduction achieved through indexing the personal income tax for inflation will have major long-run implications both for the tax burden of individuals and the revenue-generating capacity of the federal and the provincial income tax systems.

Indexing of the tax system takes effect in 1974. Accordingly, provincial budget plans must take account of the resulting reduction in personal income tax yields and the related changes to equalization entitlements. It is essential, therefore, that governments have accurate estimates of the indexing losses in 1974 and subsequent years.

This study outlines the effects of indexing on the tax burdens of individuals, and measures the dynamic impact on Ontario's income tax revenues. Chapter One discusses the theory and background of tax indexing and illustrates the impact of Canada's indexing method on the tax liabilities of representative individuals and families.

Chapter Two presents the revenue impact in Ontario which results from indexing. The revenue estimates are based on a simulation model which uses 1972 income tax records as input data. The results for 1972 are extrapolated for the years 1974 through 1980 using a projection of the potential performance of the Ontario economy at various rates of inflation.

Chapter Three deals with the incidence characteristics of the income tax system and compares tax burdens with and without indexing. A number of Appendices complete the study. The first outlines the extrapolation technique employed. The second assesses the sensitivity of the results to alternative assumptions. The third presents the implicit elasticities of the income tax system in Ontario. And the final Appendix displays the revenue impact of indexing in other provinces, in relation to the Ontario experience.

## **Summary of the Results**

The major findings with important implications for budget planning by all levels of government in Canada are as follows:

- The 1974 revenue loss to Ontario due to indexing will amount to over \$60 million, or approximately 4 per cent of the provincial personal income tax yield.

- This indexing loss will grow rapidly during the period of the revenue guarantee and could reach well over \$300 million for Ontario (depending on the inflation experience) by 1977. By 1977, this compounded impact would represent a 12 per cent or greater indexing loss in Ontario personal income tax revenues. By 1980, the compounded loss will be in the vicinity of a billion dollars, or about a 20 per cent loss in Ontario personal income tax revenues.
- The experience for Ontario applies generally for all provinces with tax collection agreements. Micro-simulation of the revenue structures of other provinces confirms that the indexing losses will be relatively greater in the low income provinces.

*Effects on representative taxpayers:* The implications of indexing for individual taxpayers are shown in Chapter One. Broadly speaking, indexing returns to taxpayers *most* of the increase in income tax liability that otherwise would occur simply as a function of inflation. Thus, individuals and families whose income rises as fast or faster than inflation will not suffer any significant deterioration in real disposable income in future years.

*Revenue effects* of indexing are displayed in Chapter Two. By 1980, with 6 per cent inflation sustained from 1974, the federal revenue decrease in Ontario due to indexing will be about \$2.8 billion and the Ontario revenue decrease about \$900 million. By 1980, the indexing revenue loss to the federal government ranges from about 18 per cent at sustained 5 per cent inflation to about 24 per cent at sustained 8 per cent inflation. The reduction in Ontario personal income tax revenues shows the same pattern.

*Incidence effects* of indexing are shown in Chapter Three. Generally, the effect of indexing is to lower the curve of tax incidence over the entire spectrum of incomes. The largest percentage reductions in tax occur in the bottom income brackets, but the largest absolute tax savings go to high-income taxpayers. For the middle-income group between \$10,000 and \$25,000, indexing generates a proportional tax saving amounting to 4 per cent in 1974, 7 per cent in 1975 and 22–24 per cent in 1980.

*Provincial results* are shown in Appendix D. These indicate that the impact of indexing on provincial revenues is relatively more severe in low-income provinces than in higher income provinces. Thus, the largest proportional losses are suffered by Newfoundland and New Brunswick. By 1977, at the end of the revenue guarantee, indexing revenue losses reach 12 per cent in British Columbia and 17 per cent in Newfoundland, with the effects on the other provinces lying between these two extremes.

**Chapter One**

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## Chapter One

# Indexing the Tax Structure To Correct For Inflation

### 1.1 Background

Inflation plays a large role in determining the personal income tax burden of individuals, and in generating revenue growth for governments. Inflation erodes gains in real income by pushing taxpayers into higher marginal rates of income tax. Moreover, as an increasing proportion of taxpayers are moved into higher marginal rate brackets, the proportion of national income absorbed by the personal income tax tends to rise. This provides a source of automatic financing for the growth of the public sector.

To illustrate how inflation increases tax burdens and erodes disposable income, consider the case of an individual with \$5,000 gross income in 1973. Suppose his gross income increases at the rate of inflation between 1974 and 1980. By 1980 his gross income will have increased to about \$8,700 (assuming 6.6 per cent inflation in 1974, sustained at 6 per cent thereafter). With no change to the 1973 tax structure, his 1980 income tax would be \$1,044 as compared to \$449 in 1973. Thus, his real disposable income would decline to 94 per cent of its level in 1973.<sup>1</sup>

The Royal Commission on Taxation did not recommend any built-in mechanism to offset the distortionary effects of inflation on taxation. First, the commissioners considered it impossible to compensate completely and equitably for the decline in real income brought about by inflation. Second, the commissioners believed that an inflationary offset would damage the built-in stabilization properties of the tax system.<sup>2</sup> The fact that the level of inflation from 1952 through 1965 was relatively moderate, only once reaching 3.2 per cent in 1957 and averaging about 1.5 per cent per annum over the interval, may have contributed to the assessment that an inflationary offset in the income tax structure was not of paramount importance.

Since 1965, the rate of inflation has escalated significantly, reaching 4.8 per cent per annum in 1972 and 9.1 per cent per annum in 1973. Moreover, high levels of inflation seem likely to persist into the foreseeable future. Thus, the distorting impact of inflation on the income tax

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<sup>1</sup>This example assumes the \$1,600 personal exemption, \$100 medical and charitable deduction, UIC contributions of \$70 and \$124 respectively and pension deductions of 6% of gross income, up to a maximum of \$2,500. The tax system assumes the federal 5% tax reduction with a \$100 minimum and \$500 maximum and provincial tax at 30.5 per cent. Property taxes in 1973 are assumed to be \$400 and increase with inflation.

<sup>2</sup>*Report of the Royal Commission on Taxation*, (Ottawa: Queen's Printer, 1966), Vol. 3, p. 349, and Vol. 2, p. 33. Commonly referred to as the Carter Report.

system could be expected to increase in the years ahead in the absence of some compensating device.

Various techniques to provide a built-in offset for inflation have been suggested for some time. A proposal in which a taxpayer's income is converted to real terms, thereby avoiding the necessity of annual adjustments to the exemptions, deductions and tax rates was first made in 1965 by Amotz Morag in his book *On Taxes and Inflation*.<sup>3</sup> Mr. Stanfield, the leader of the federal Conservative Opposition, made a similar proposal in the course of the 1972 budget debate in Ottawa.<sup>4</sup> An alternative proposal which also incorporated a device to tax capital gains in real terms was made in 1970 by John Helliwell and advocated at the 1970 Conference of the Canadian Tax Foundation by Robert Clark.<sup>5</sup> Under this proposal, there would be annual adjustments to the exemptions or tax credits, the standard deduction, the maximum dollar deduction for employee expenses and the boundaries of the income tax brackets. John Bossons, favouring the introduction of tax credits as recommended by the Carter Commission and the *Ontario Proposals for Tax Reform in Canada*, suggested that these credits be revised annually to adjust for the effects of inflation, as well as revisions to the brackets as suggested by Robert Clark.<sup>6</sup> By contrast to automatic annual adjustments proposed in all the above recommendations, the Carter Commission was "convinced that it would be a serious error to relate transfer payments and tax credits to a price index so that they increased automatically."<sup>7</sup>

## 1.2 The Federal Indexing System

The inflation offset in the personal income tax to take effect in 1974 requires annual adjustments to the personal exemptions and the income tax brackets. The tax system is indexed by the change in the Consumer Price Index over the twelve month period ending the 30th of September of the previous year. For the 1974 tax year, the indexing factor is 6.6 per cent. The personal exemptions increased by this factor include the single and married exemptions, the exemptions for children, nieces, nephews and other dependants, and the exemption for the elderly, blind persons and those confined to bed or wheel chairs. The income tax brackets are also increased by the indexing factor.

The effects of indexing on the personal exemptions for 1974 and 1980 are shown in Table 1-1. The exemption for a single person which

<sup>3</sup>Amotz Morag, *On Taxes and Inflation* (New York: Random House, 1965), Chapter 7.

<sup>4</sup>The Hon. Robert Stanfield, *House of Commons Debates*, Vol. 116, No. 52, pp. 2263-9, (May 15, 1972).

<sup>5</sup>John F. Helliwell, "Inflation and Tax Reform", *Canadian Tax Journal*, Vol. XVIII, No. 2, March-April 1970; and Robert M. Clark, "Inflation, Taxation and the White Paper", *Proceedings of the 22nd Tax Conference* (Toronto: Canadian Tax Foundation, 1970), pp. 213-229.

<sup>6</sup>*Report of the Royal Commission on Taxation, op. cit.*, Vol. 3, Chapters 7 and 11; The Hon. Charles MacNaughton, *Ontario Proposals for Tax Reform in Canada* (Toronto: Department of Treasury & Economics, 1970), Chapter 3; and John Bossons, "The Impact of Tax Rates on the Effect of Tax Reform", *Proceedings of the 22nd Tax Conference, op. cit.*, pp. 26-59.

<sup>7</sup>*Report of the Royal Commission on Taxation, op. cit.*, Vol. 2, pp. 32-33.

Table 1-1  
**Personal Exemptions**  
**Under the Federal Indexing System**

	1974		1980	
	Unindexed	Indexed	Unindexed	Indexed
Single Exemption	1,600	1,706	1,600	2,416
Married Exemption	1,400	1,492	1,400	2,114
Child under 16	300	320	300	453
Child 16 and Over	550	586	550	830
Elderly Exemption	1,000	1,066	1,000	1,510
Blind or Wheel Chair	1,000	1,066	1,000	1,510

Note: The 1980 indexed exemptions assume an indexing factor of 6.6 per cent in 1974 and 6 per cent thereafter.

Table 1-2  
**Income Tax Brackets**  
**Under the Federal Indexing System**

Unindexed	Indexed	
	1974	1980
500	533	756
1,000	1,066	1,512
2,000	2,132	3,024
3,000	3,198	4,536
5,000	5,330	7,561
7,000	7,462	10,585
9,000	9,594	13,609
11,000	11,726	16,633
14,000	14,924	21,170
24,000	25,584	36,291
39,000	41,574	58,973
60,000	63,960	90,728

Note: The 1980 indexed brackets assume an indexing factor of 6.6 in 1974 and 6 per cent thereafter.

is \$1,600 in 1973 increases to \$1,706 in 1974 and rises to \$2,416 in 1980 assuming sustained 6 per cent inflation. The income tax brackets for 1974 and 1980 are shown in Table 1-2. Thus, in 1973, the lowest marginal tax rate applies to taxable income up to \$500. In 1974, this boundary rises to \$533 and by 1980 reaches \$756 at sustained 6 per cent inflation.

The federal indexing system represents a partial implementation of the more general adjustment to exemptions and deductions proposed by analysts of the Canadian tax system. These more general proposals

Table 1-3  
**Elements of the Tax Structure  
 Affected by the Federal Indexing System**

---

*Indexed by the federal system.*

1. Personal exemptions.
2. Income tax brackets.
3. The Ontario Tax Credit System.

*Not indexed by the federal system.*

1. Standard \$100 medical and charitable deduction.
  2. Maximum dollar deduction for employee expenses.
  3. Limits on contributions to pension and retirement savings plans.
- 

Note: Contributions to the Canada Pension Plan vary annually by a formula agreed to by the federal and provincial governments.

include the annual indexing of the standard \$100 deduction and the maximum dollar deduction for employee expenses as well as the measures implemented by the federal government.<sup>8</sup> A summary of the elements affected by the tax system and the principal elements not indexed is presented in Table 1-3.

Under the indexing system adopted by the federal government, the two principal criticisms of the concept of indexing appear to have been met. First, the system applies to all income whatever its source. Second, preliminary simulation experiments indicate that indexing need not reduce the stabilizing properties of the income tax system. By applying indexing with a lag, taxpayers are compensated for past inflation, thereby preserving the current response of revenue flows to the current level of inflation.<sup>9</sup>

### 1.3 The Impact of Indexing on Individuals

It is important that individuals understand how the tax system will affect their take-home pay and real disposable income in the years ahead.

The inflationary erosion of real disposable income without an indexed tax structure is shown in Table 1-4. For all the examples in this table, it is assumed that total earnings increase at the rate of inflation (which in all the examples in this section is 6.6 per cent in 1974 and 6 per cent thereafter). Take-home pay is calculated as total earnings net of U.I.C. premiums, pension contributions, federal and Ontario

<sup>8</sup>Robert M. Clark, "Inflation, Taxation and the White Paper", *op. cit.*, p. 217.

<sup>9</sup>For an examination of the historic effect in Canada of inflation on real tax rates see George Vukelich, "The Effect of Inflation on Real Tax Rates", *Canadian Tax Journal*, Vol. XX, No. 4, July-August 1972, pp. 327-342. The effects of indexing on the automatic stabilization aspects of the system have been examined in: John Bossons and Thomas A. Wilson, "Adjusting Tax Rates for Inflation", *Canadian Tax Journal*, Vol. XXI, No. 3, May-June, 1973, pp. 185-199.



income tax and the Ontario Tax Credits. Real disposable income is take-home pay expressed in 1973 dollars. The single filer in these examples has no dependants; the married couple has two children under 16.

Without the introduction of indexing, income tax liability rises and take-home pay (expressed in 1973 dollars) declines substantially for individuals whatever the level of total earnings. However, this erosion of real disposable income would be greater for the married filer than for the single filer. Thus, at \$5,000 gross income in 1973, the single filer has 94 per cent of his 1973 disposable income by 1980 while the married filer with two children has only 92 per cent of his 1973 disposable income.

Before indexing, the erosion of take-home pay is greatest for the married filer at \$15,000 to \$20,000 total earnings in 1973. In this income range, take-home pay in 1973 terms would decline to 91 per cent of its real 1973 value by 1980.

Table 1-4  
**1980 Real Disposable Income as a Per Cent  
of 1973, Before and After Indexing**  
(Assumes Income Increases at Inflation Rate)

Gross Income	Single		Married	
	Before	After	Before	After
	%	%	%	%
\$ 5,000	94	99	92	99
10,000	94	100	93	100
15,000	92	100	91	100
20,000	93	100	91	100
25,000	92	100	92	100
30,000	92	101	92	100
35,000	92	101	92	101

Source: Representative taxfiler analysis.

- Notes: 1. Take-home pay is total earnings less U.I.C. premiums, pension contributions and federal and provincial personal income tax. Real disposable income is take-home pay expressed in 1973 dollars.
2. Pension contributions are 6% of total earnings up to a maximum of \$2,500. U.I.C. contribution is 1.4% of total earnings up to an income of \$8,840.
3. Assumes total earnings increase at the inflation and indexing rate: 6.6% in 1974 and 6% thereafter.
4. The married example assumes 2 children under 16 claimed as dependants.
5. Ontario tax payable is net of the Ontario Tax Credits.

The introduction of indexing ensures that take-home pay in 1980 stays almost level with its real value in 1973. In these examples, there are only slight discrepancies from this uniform stabilization of real

disposable income through indexing. Where total 1973 earnings are \$5,000 for either the single filer or married couple, there is one per cent less disposable income in real terms by 1980. And where total earnings in 1973 are \$30,000 or more, there is one per cent more real disposable income by 1980.

The real disposable income situation for both single and married filers varies slightly year by year to 1980. In the examples here, the peak increase in real disposable income is reached in 1976 for those with total 1973 earnings up to \$25,000. It diminishes slightly after 1976. For those with higher 1973 total earnings, real disposable income continues to increase to 1980. Again, it should be emphasized that the variations are slight, ranging within one per cent.

A more detailed display of the effects of indexing on the single filer with 1973 total earnings of \$5,000, \$10,000, \$15,000 and \$20,000 is given in Table 1-5. Here total earnings are assumed to increase at the inflation rate. The tax structure reflects the annual reduction in the bottom marginal rate of tax and the 5 per cent reduction in federal tax with a \$100 minimum and a \$500 maximum.

Tax payable to Ontario is net of the Ontario Tax Credits. In arriving at taxable income, pension contributions to all plans are taken as 6 per cent of gross income up to a maximum of \$2,500 and U.I.C. contributions are 1.4 per cent of total earnings up to an income of \$8,840 for all years.

The individual with total earnings of \$5,000 in 1973 pays \$323 less federal and provincial income tax by 1980 under the indexed tax structure than he would have paid under the unindexed structure. Between 1973 and 1980, his take-home pay increases from \$4,181 to \$6,280 under the indexed system. In real terms, this represents a change from \$4,181 in 1973 to \$4,153 in 1980, or a reduction of \$28 in real disposable income. The individual with \$10,000 total earnings in 1973 pays \$648 less tax under the indexed system than he would have otherwise by 1980 and his real disposable income increases by \$4 between its 1973 level of \$7,438 and its 1980 level of \$7,442. Similarly, individuals starting with 1973 total earnings of \$15,000 or \$20,000 experience an increase in real disposable income by 1980.

Results similar to those shown in Table 1-5 are shown in Table 1-6 for the married couple with two children under 16 at corresponding levels of total earnings. In this instance, the real disposable income of the family with \$5,000 earnings in 1973 declines by \$27 and the real disposable income for the family with a gross income of \$10,000 in 1973 declines by \$4 under the indexed tax system in 1980. With indexing, the family with starting earnings of \$15,000 experiences a \$23 increase in real disposable income by 1980 and the family with \$20,000 total earnings in 1973 experiences a growth in real disposable income of \$110.

Table 1-5  
**Single Taxfiler**  
 (Assumes Income Increases at Inflation Rate)

	1973	1980	
		Unindexed	Indexed
	\$	\$	\$
Total Earnings	5,000	7,561	7,561
Personal Exemption	1,600	1,600	2,419
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	70	106	106
Pension Contributions	300	454	454
Total Deductions	2,220	2,409	3,229
Taxable Income	2,780	5,151	4,332
Federal Tax Payable	411	865	630
Ontario Tax Payable	38	179	91
Total Tax Payable	449	1,044	721
Take-Home Pay	4,181	5,957	6,280
Real Disposable Income (\$ 1973)	4,181	3,939	4,153
Total Earnings	10,000	15,121	15,121
Personal Exemption	1,600	1,600	2,419
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	124	124	124
Pension Contributions	600	907	907
Total Deductions	2,574	2,881	3,700
Taxable Income	7,426	12,240	11,421
Federal Tax Payable	1,442	2,674	2,195
Ontario Tax Payable	396	810	641
Total Tax Payable	1,838	3,484	2,836
Take-Home Pay	7,438	10,606	11,254
Real Disposable Income (\$ 1973)	7,438	7,014	7,442

- Notes: 1. Take-home pay is total earnings less U.I.C., pension contributions and federal and provincial personal income tax. Real disposable income is take-home pay expressed in 1973 dollars.
2. Pension contributions are 6% of total earnings up to a maximum of \$2,500. U.I.C. contribution is 1.4% of total earnings up to an income of \$8,840.
3. Assumes total earnings increase at the inflation and indexing rate: 6.6% in 1974 and 6% thereafter.
4. Ontario tax payable is net of the Ontario Tax Credits. Property taxes in 1973 are \$400, \$420, \$500 and \$800 and increase with inflation.
5. Numbers may not add to totals due to rounding.

Table 1-5 (continued)

## Single Taxfiler

(Assumes Income Increases at Inflation Rate)

	1973	1980	
		Unindexed	Indexed
	\$	\$	\$
Total Earnings	15,000	22,682	22,682
Personal Exemption	1,600	1,600	2,419
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	124	124	124
Pension Contributions	900	1,361	1,361
Total Deductions	2,874	3,335	4,154
Taxable Income	12,126	19,347	18,528
Federal Tax Payable	2,683	4,970	4,049
Ontario Tax Payable	826	1,596	1,295
Total Tax Payable	3,509	6,566	5,344
Take-Home Pay	10,467	14,631	15,853
Real Disposable Income (\$ 1973)	10,467	9,676	10,484
Total Earnings	20,000	30,243	30,243
Personal Exemption	1,600	1,600	2,419
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	124	124	124
Pension Contributions	1,200	1,815	1,815
Total Deductions	3,174	3,788	4,608
Taxable Income	16,826	26,455	25,635
Federal Tax Payable	4,174	7,426	6,311
Ontario Tax Payable	1,322	2,384	2,026
Total Tax Payable	5,496	9,811	8,338
Take-Home Pay	13,180	18,493	19,966
Real Disposable Income (\$ 1973)	13,180	12,230	13,204

- Notes: 1. Take-home pay is total earnings less U.I.C., pension contributions and federal and provincial personal income tax. Real disposable income is take-home pay expressed in 1973 dollars.
2. Pension contributions are 6% of total earnings up to a maximum of \$2,500. U.I.C. contribution is 1.4% of total earnings up to an income of \$8,840.
3. Assumes total earnings increase at the inflation and indexing rate: 6.6% in 1974 and 6% thereafter.
4. Ontario tax payable is net of the Ontario Tax Credits. Property Taxes in 1973 are \$400, \$420, \$500 and \$800 respectively and increase with inflation.
5. Numbers may not add to totals due to rounding.

Table 1-6  
**Married Taxfiler—Two Dependents**  
 (Assumes Income Increases at Inflation Rate)

	1973	1980	
		Unindexed	Indexed
	\$	\$	\$
Total Earnings	5,000	7,561	7,561
Personal Exemption	3,600	3,600	5,444
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	70	106	106
Pension Contributions	300	454	454
Total Deductions	4,220	4,409	6,253
Taxable Income	780	3,151	1,308
Federal Tax Payable	25	442	45
Ontario Tax Payable	-120	10	-148
Total Tax Payable	-95	452	-103
Take-Home Pay	4,725	6,549	7,104
Real Disposable Income (\$ 1973)	4,725	4,331	4,698
Total Earnings	10,000	15,121	15,121
Personal Exemption	3,600	3,600	5,444
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	124	124	124
Pension Contributions	600	907	907
Total Deductions	4,574	4,881	6,725
Taxable Income	5,426	10,240	8,397
Federal Tax Payable	973	2,114	1,499
Ontario Tax Payable	213	591	364
Total Tax Payable	1,186	2,705	1,863
Take-Home Pay	8,090	11,385	12,227
Real Disposable Income (\$ 1973)	8,090	7,529	8,086

- Notes: 1. Take-home pay is total earnings less U.I.C., pension contributions and federal and provincial personal income tax. Real disposable income is take-home pay expressed in 1973 dollars.
2. Pension contributions are 6% of total earnings up to a maximum of \$2,500. U.I.C. contribution is 1.4% of total earnings up to an income of \$8,840.
3. Assumes total earnings increase at the inflation and indexing rate: 6.6% in 1974 and 6% thereafter.
4. Ontario tax payable is net of the Ontario Tax Credits. Property taxes in 1973 are \$400, \$420, \$500 and \$800 respectively and increase with inflation.
5. Numbers may not add to totals due to rounding.

Table 1-6 (continued)

**Married Taxfiler—Two Dependents**  
(Assumes Income Increasing at Inflation Rate)

	1973	1980	
		Unindexed	Indexed
	\$	\$	\$
Total Earnings	15,000	22,682	22,682
Personal Exemption	3,600	3,600	5,444
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	124	124	124
Pension Contributions	900	1,361	1,361
Total Deductions	4,874	5,335	7,178
Taxable Income	10,126	17,347	15,504
Federal Tax Payable	2,127	4,305	3,201
Ontario Tax Payable	608	1,353	963
Total Tax Payable	2,735	5,658	4,164
Take-Home Pay	11,241	15,539	17,033
Real Disposable Income (\$ 1973)	11,241	10,276	11,264
Total Earnings	20,000	30,243	30,243
Personal Exemption	3,600	3,600	5,444
Medical Expenses	100	100	100
Employment Expenses	150	150	150
U.I.C.	124	124	124
Pension Contributions	1,200	1,815	1,815
Total Deductions	5,174	5,788	7,632
Taxable Income	14,826	24,455	22,611
Federal Tax Payable	3,509	6,685	5,306
Ontario Tax Payable	1,069	2,144	1,664
Total Tax Payable	4,578	8,829	6,970
Take-Home Pay	14,098	19,475	21,334
Real Disposable Income (\$ 1973)	14,098	12,879	14,108

- Notes: 1. Take-home pay is total earnings less U.I.C., pension contributions and federal and provincial personal income tax. Real disposable income is take-home pay expressed in 1973 dollars.
2. Pension contributions are 6% of total earnings up to a maximum of \$2,500. U.I.C. contribution is 1.4% of total earnings up to an income of \$8,840.
3. Assumes total earnings increase at the inflation and indexing rate: 6.6% in 1974 and 6% thereafter.
4. Ontario tax payable is net of the Ontario Tax Credits. Property taxes in 1973 are \$400, \$420, \$500 and \$800 respectively, and increase with inflation.
5. Numbers may not add to totals due to rounding.

The income of many individuals grows faster than inflation. Real productivity increases of the sort experienced in Canada since World War II indicate an average of about 2 per cent per member of the employed labour force per year. If productivity improvements remain of this order in coming years, it will be possible for employees to experience about a 2 per cent increase in income per year above and beyond inflationary adjustments. With this in mind, the situation with real disposable incomes increasing at inflation plus 2 per cent each year is of some interest. For the single individual, before indexing, the increase in real disposable income ranges from 6 per cent of the 1973 level at \$5,000 gross to 3 per cent at \$35,000. After indexing, the increase in real disposable income ranges from 11 per cent to 13 per cent in 1980 over 1973. Relative to the single individual, the married couple with two young children has a smaller increase before indexing and about the same increase in real disposable income after indexing. For example, the couple with \$10,000 gross income in 1973 has an increase in real disposable income by 1980 of 4 per cent before indexing and 12 per cent after indexing. In other words, after indexing, the couple captures slightly less than a 2 per cent increase in real disposable income per year.

The impact of indexing on Ontario pensioners is particularly interesting at two income levels: first, the level at which the pensioner has no income from any source other than the Old Age Security payment (O.A.S.), the Guaranteed Income Supplement (G.I.S.), the Ontario Tax Credits and the Ontario Pensioner Assistance Grant; and second, the level at which the pensioner derives enough income from other sources to qualify for no more than the minimum amount of G.I.S. support. These situations are illustrated in Table 1-7 for both the single pensioner and the pensioner couple.

Both the O.A.S. and G.I.S. payments are now indexed for inflation. Thus, for the single pensioner with no outside income, income from these two sources will increase to \$3,251 by 1980 (with 6.6 per cent inflation in 1974 and 6 per cent thereafter). The Ontario Credits will increase to \$280 and the Ontario Pensioner Assistance Grant is assumed unchanged over the period.<sup>10</sup> In real disposable terms, after indexing, the income of this pensioner declines \$81 between 1973 and 1980.

The single pensioner with sufficient income from other sources to place him on the G.I.S. threshold in 1973 has, by 1980, \$350 more disposable income than he would have had without indexing. However, even after indexing, his real disposable income has declined by \$82 between 1973 and 1980. The results for the married pensioner couple broadly parallel those for the single individual.

The circumstances of the pensioners presented here makes very clear the inadequacy of the indexed tax structure to sustain the real

<sup>10</sup>For a description of Ontario's Tax Credit System see: The Hon. John White, *Ontario Budget 1973* (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs).

Table 1-7

**Single Pensioner**

(Income Increasing at Inflation Rate)

	1973	1980	
		Unindexed	Indexed
	\$	\$	\$
Total Income	2,150	3,251	3,251
O.A.S.	1,264	1,911	1,911
G.I.S.	886	1,340	1,340
Other Income	0	0	0
Personal Exemption	1,600	1,600	2,419
Age Exemption	1,000	1,000	1,512
Medical Expenses	100	100	100
Total Deductions	2,700	2,700	4,031
Taxable Income	0	0	0
Federal Tax Payable	0	0	0
Ontario Tax Payable	-249	-266	-279
Total Tax Payable	-249	-266	-279
Ontario Pensioner Grant	50	50	50
Disposable Income	2,449	3,567	3,580
Real Disposable Income (\$ 1973)	2,449	2,359	2,368
Total Income	3,049	4,597	4,597
O.A.S.	1,264	1,911	1,911
G.I.S.	12	18	18
Other Income	1,773	2,668	2,668
Personal Exemption	1,600	1,600	2,419
Age Exemption	1,000	1,000	1,512
Medical Expenses	100	100	100
Total Deductions	2,700	2,700	4,031
Taxable Income	337	1,879	548
Federal Tax Payable	0	232	0
Ontario Tax Payable	-231	-146	-264
Total Tax Payable	-231	86	-264
Ontario Pensioner Grant	50	50	50
Disposable Income	3,330	4,561	4,911
Real Disposable Income (\$ 1973)	3,330	3,016	3,248

- Notes: 1. Based on 4th quarter O.A.S. and G.I.S. rates for 1973. Canada Pension Income would be included among other income and reduce G.I.S. Income proportionately. Assumes O.A.S., G.I.S. and property tax increase at the inflation rate: 6.6% in 1974 and 6% thereafter. It is assumed that property tax paid in 1973 is \$330 or rent paid \$1,650.
2. Disposable income is total income less federal and provincial personal income tax. Real disposable income is disposable income expressed in 1973 dollars.
3. Ontario Tax Payable is net of the Ontario Tax Credits, which are partially indexed for inflation.
4. Numbers may not add to totals due to rounding.



Table 1-7 (continued)  
**Married Couple—Both Pensioners**  
 (Income Increasing at Inflation Rate)

	1973	1980	
		Unindexed	Indexed
	\$	\$	\$
Total Income	4,101	6,202	6,202
O.A.S.	2,527	3,821	3,821
G.I.S.	1,574	2,381	2,381
Other Income	0	0	0
Personal Exemption	3,000	3,000	4,536
Age Exemption	1,000	1,000	1,512
Medical Expenses	100	100	100
Total Deductions	4,100	4,100	6,148
Taxable Income	0	0	0
Federal Tax Payable	0	0	0
Ontario Tax Payable	-263	-280	-300
Total Tax Payable	-263	-280	-300
Ontario Pensioner Grant	100	100	100
Disposable Income	4,464	6,582	6,602
Real Disposable Income (\$ 1973)	4,464	4,353	4,366
Total Income	5,688	8,576	8,576
O.A.S.	2,527	3,821	3,821
G.I.S.	12	18	18
Other Income	3,149	4,737	4,737
Personal Exemption	3,000	3,000	4,536
Age Exemption	1,000	1,000	1,512
Medical Expenses	100	100	100
Total Deductions	4,100	4,100	6,148
Taxable Income	1,576	4,458	2,410
Federal Tax Payable	174	761	252
Ontario Tax Payable	-163	28	-169
Total Tax Payable	11	789	83
Ontario Pensioner Grant	100	100	100
Disposable Income	5,777	7,887	8,593
Real Disposable Income (\$ 1973)	5,777	5,216	5,683

- Notes: 1. Based on 4th quarter O.A.S. and G.I.S. rates for 1973. Canada Pension Income would be included among other income and reduce G.I.S. income proportionately. Assumes O.A.S., G.I.S. and property tax increase at the inflation rate: 6.6% in 1974 and 6% thereafter. It is assumed that property tax paid in 1973 is \$330 or rent paid \$1,650.
2. Disposable income is total income less federal and provincial personal income tax. Real disposable income is disposable income expressed in 1973 dollars.
3. Ontario Tax Payable is net of the Ontario Tax Credits, which are partially indexed for inflation.
4. Numbers may not add to totals due to rounding.

disposable income of the lowest income groups. This is the case even though the O.A.S. and G.I.S. payments are both indexed for inflation. This result occurs because the total income of the lowest income pensioners never reaches the ceiling on exemptions. The indexed Ontario Credits, by providing a refundable amount which escalates with inflation makes a substantial contribution towards offsetting the erosion of real disposable income for pensioners and other low income individuals in Ontario.

**Chapter Two**

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## **Chapter Two**

# **The Effects on Revenue of Indexing the Income Tax**

### **2.1 Introduction**

Indexing of the personal income tax system (P.I.T.) from 1974 ensures that personal income tax revenues to the federal and Ontario governments will be lower in future than they otherwise would have been. By eliminating inflation-generated tax increases to individuals, indexing also eliminates inflation-generated revenue gains to government. This reduction in the revenue growth potential of the personal income tax may be readily absorbed in the case of the federal government because of its surplus financial capacity. For the provinces, however, reduced P.I.T. revenue growth and related cuts in equalization payments represent a substantial deterioration in their long-run financing position.

### **2.2 Projected Revenue Losses from Indexing**

This chapter presents the magnitude of the “revenue losses” which will occur in Ontario as a result of indexing. Figures are shown both for the Ontario Government and for the federal government over a time horizon from 1974 to 1980. This long-run time frame is important because it demonstrates the dynamic effects and the year-by-year compounding of indexing losses on personal income tax revenues.

The results in Table 2-1 show the expected personal income tax revenues in Ontario for both the federal and Ontario governments, assuming 6 per cent inflation is sustained from 1974 to 1980. Without the introduction of indexing, federal P.I.T. revenues from Ontario are projected at about \$4.9 billion in 1974 rising to \$13.9 billion by 1980. Ontario P.I.T. revenues are projected at \$1.6 billion in 1974 rising to \$4.5 billion by 1980. The estimates of revenue losses to Ontario do not take account of the costs of the Ontario Tax Credit System. The revenue decrease due to indexing is projected at \$199 million for the federal government and \$64 million for the Ontario Government in 1974. By 1980, the difference between the revenue yield of the unindexed tax system and the indexed system implies a revenue decrease of \$2.8 billion for the federal government and \$889 million for the Ontario Government in that year.

The projected levels of federal P.I.T. revenues from Ontario at various rates of inflation are shown in Table 2-2 for the tax structure both before and after indexing. The results indicate that in 1974 federal

Table 2-1  
**Projected Personal Income Tax Revenues in Ontario**  
 (Sustained 6% Inflation)

	1974	1975	1977	1980
	(\$ Million)			
<i>Before Indexing</i>				
Federal Revenue	4,930	5,881	8,341	13,940
Ontario Revenue	1,631	1,933	2,716	4,497
Total	<u>6,561</u>	<u>7,814</u>	<u>11,057</u>	<u>18,437</u>
<i>After Indexing</i>				
Federal Revenue	4,731	5,459	7,243	11,162
Ontario Revenue	1,567	1,798	2,363	3,608
Total	<u>6,298</u>	<u>7,257</u>	<u>9,606</u>	<u>14,770</u>
<i>Decrease from Indexing</i>				
Federal Revenue	199	422	1,098	2,778
Ontario Revenue	64	135	353	889
Total Difference	<u>263</u>	<u>557</u>	<u>1,451</u>	<u>3,667</u>

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. The tax structure before indexing includes taxation of the indexed Family Allowance payments, the increase in personal exemptions for 1973, the annual reduction in the bottom marginal rate and the 1973, 5% reduction in federal tax (\$100 minimum, \$500 maximum). UIC premiums reflect the January, 1974 increase in premium rates.
2. The tax structure after indexing allows for the indexing of personal exemptions and brackets. The 1974 system is indexed by 6.6%, thereafter by the rate indicated by the pattern of inflation.
3. Estimates assume 1973 real growth of 7% and inflation of 6.5%. For subsequent years, real growth is assumed to be 5.6% per annum and inflation at 6% per annum.
4. The employed labour force in Ontario is estimated assuming a 4% level of unemployment is maintained to 1980. The employed labour force is estimated to grow at an average rate of 2.7% p.a. from 1973 to 1975. From 1976 to 1980, the employed labour force is assumed to increase by 2.3% p.a. The taxfiling population increases by about 4% p.a. between 1972 and 1975 and by 3.48% p.a. in 1976, rising to 3.66% p.a. in 1980.

P.I.T. revenues will decrease by \$197 million with an assumption of 5 per cent inflation as compared to \$204 million assuming 8 per cent inflation. By 1980, the reduction in federal P.I.T. revenues will be \$2.2 billion with the assumption of 5 per cent sustained inflation or \$4 billion with the assumption of sustained 8 per cent inflation.

The corresponding projections of Ontario P.I.T. revenues at various rates of inflation are shown in Table 2-3. By 1980, Ontario revenues would decrease by \$717 million at 5 per cent sustained inflation rising to \$1.3 billion at 8 per cent sustained inflation.

The percentage decrease of P.I.T. revenues between the unindexed and indexed system is shown in Table 2-4. For any rate of inflation,

Table 2-2  
**Projected Federal P.I.T. Revenues in Ontario**

	1974	1975	1977	1980
	(\$ Million)			
<i>Before Indexing</i>				
5% Inflation	4,846	5,684	7,813	12,526
6% Inflation	4,930	5,881	8,341	13,940
7% Inflation	5,015	6,082	8,893	15,477
8% Inflation	5,100	6,286	9,470	17,138
<i>After Indexing</i>				
5% Inflation	4,649	5,292	6,875	10,287
6% Inflation	4,731	5,459	7,243	11,162
7% Inflation	4,813	5,621	7,617	12,097
8% Inflation	4,896	5,791	8,007	13,092
<i>Decrease from Indexing</i>				
5% Inflation	197	392	938	2,239
6% Inflation	199	422	1,098	2,778
7% Inflation	202	461	1,276	3,380
8% Inflation	204	495	1,463	4,046

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. The tax structure before indexing includes taxation of the indexed Family Allowance payments, the increase in personal exemptions for 1973, the annual reduction in the bottom marginal rate and the 1973, 5% reduction in federal tax (\$100 minimum, \$500 maximum). UIC premiums reflect the January, 1974 increase in premium rates.
2. The tax structure after indexing allows for the indexing of personal exemptions and brackets. The 1974 system is indexed by 6.6%, thereafter by the rate indicated by the pattern of inflation.

the year-by-year increment to the losses diminishes. However, tentative tests conducted for the mid-1980's indicate that the revenue losses will not have stabilized by then. When will the revenue losses stabilize as a percentage of pre-indexed revenues? This is an important question of research which is as yet far from answered satisfactorily.

The revenue effects presented here are subject to continuing revision as the actual real growth and inflation rates for 1973 are published and the final 1972 *Green Book* data become available.<sup>11</sup> Further improvements and modifications of the projection technique will be incorporated in the analysis as they are developed.

### 2.3 Method of Measuring the Revenue Impact of Indexing

The estimates presented in the preceding analysis are developed within the economic framework of the Ontario economy growing along its potential full employment growth path to 1980 within the context of various sustained rates of inflation. The method incorporates further

<sup>11</sup>These data are published annually in *Taxation Statistics* (Ottawa: Department of National Revenue) which is commonly referred to as the *Green Book*.

Table 2-3  
**Projected Ontario P.I.T. Revenues**

	1974	1975	1977	1980
	(\$ Million)			
<i>Before Indexing</i>				
5% Inflation	1,604	1,871	2,548	4,049
6% Inflation	1,631	1,933	2,716	4,497
7% Inflation	1,658	1,997	2,890	4,983
8% Inflation	1,685	2,061	3,074	5,509
<i>After Indexing</i>				
5% Inflation	1,541	1,745	2,247	3,332
6% Inflation	1,567	1,798	2,363	3,608
7% Inflation	1,593	1,849	2,481	3,904
8% Inflation	1,619	1,902	2,605	4,218
<i>Decrease from Indexing</i>				
5% Inflation	63	126	301	717
6% Inflation	64	135	353	889
7% Inflation	65	148	409	1,079
8% Inflation	66	159	469	1,291

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. The tax structure before indexing includes taxation of the indexed Family Allowance payments, the increase in personal exemptions for 1973, the annual reduction in the bottom marginal rate and the 1973, 5% reduction in federal tax (\$100 minimum, \$500 maximum). UIC premiums reflect the January, 1974 increase in premium rates.
2. The tax structure after indexing allows for the indexing of personal exemptions and brackets. The 1974 system is indexed by 6.6%, thereafter by the rate indicated by the pattern of inflation.

Table 2-4  
**Percentage Reduction in P.I.T. Revenues in Ontario**

	1974	<i>Federal</i>		
		1975	1977	1980
	(%)	(%)	(%)	(%)
<i>Inflation</i>				
5%	4.1	6.9	12.0	17.9
6%	4.0	7.2	13.2	19.9
7%	4.0	7.6	14.3	21.8
8%	4.0	7.9	15.4	23.6
		<i>Ontario</i>		
<i>Inflation</i>				
5%	3.9	6.7	11.8	17.7
6%	3.9	7.0	13.0	19.8
7%	3.9	7.4	14.2	21.7
8%	3.9	7.7	15.3	23.4

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

Note: The reduction is calculated as a per cent of pre-indexed tax revenues.



refinements of the earlier work done by the Ontario Treasury in projecting the revenue effects to 1980 in Canada of the old personal income tax system and the federal White Paper tax reform proposals of 1969.<sup>12</sup>

The estimates of the dynamic revenue impact of indexing the personal income tax are developed using the Ontario Tax Indexing Simulator (TISIM).<sup>13</sup> This is a micro-simulation model based on a scientific sample of 1972 income tax returns for Ontario. The estimates are simulated for the years 1974 through 1980 using a projection of the potential performance of the Ontario economy at various rates of inflation.

The analysis is based on a preliminary sample of 1972 income tax records for Ontario. In co-operation with the other provinces, Ontario has also processed their 1972 income tax data using the same economic framework as used for the Ontario projections. A summary of the revenue losses for the other provinces is presented in Appendix D.

The use of 1972 preliminary data has the major advantage of applying the actual tax structure reforms which came into effect for the first time in 1972. The tax structure simulation is thus confined to post-tax reform changes introduced by the federal government, including: the 1973 increase in the single, married and aged exemptions, the new Family Allowance payments and taxation of these payments, and the increase in U.I.C. premiums from January, 1974.

For the comparisons in this study, the tax structure before indexing includes taxation of the Family Allowance payments, the increase in personal exemptions for 1973, the staged reduction in the bottom marginal rate of tax to 1976, and the 5 per cent reduction in federal tax with a \$100 minimum and a \$500 maximum.

The tax structure after indexing allows for the indexing of personal exemptions and brackets. The 1974 tax system is indexed by 6.6 per cent and thereafter the indexing rate is as indicated by the pattern of inflation over the projection interval.

The Ontario data for these estimates are generated from a 10 per cent sample of the 1972 *Green Book* records for Ontario, comprising 21,780 records. This *Green Book* sample for Ontario was taken late in October, 1973 and reflects 98 per cent of the 1972 returns processed through initial assessing by the Department of National Revenue. The results obtainable by this preliminary data should closely approximate the results obtainable by using the full sample of records.

The final *Green Book* data will be available later in 1974. This data will be analyzed in the TISIM model and the estimates in this study will

<sup>12</sup>Staff Paper, *Tax Reform and Revenue Growth to 1980*, Ontario Studies in Tax Reform 4, (Toronto: Department of Treasury and Economics, 1971).

<sup>13</sup>Harry Newton, *The Tax Indexing Simulator (TISIM)*, Supplementary material to Ontario Tax Studies 9, (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1974), forthcoming.

be revised in the light of the more complete data. This revision is a part of the continuing process of updating which is undertaken as more current data become available or as improvements in the methodology for simulation and revenue projection are made.

The revenue and incidence projections in this study assume that the Ontario economy grows along its potential, full employment real growth path from 1974 to 1980. In 1973, real growth is taken as 7 per cent and inflation 6.5 per cent. Future revisions of the analysis will incorporate final real growth figures for 1973 and the actual inflation rate as part of the continuing program of monitoring the effects of indexing.

For 1974 and after, real growth is assumed to be 5.6 per cent a year. Estimates have been made assuming inflation at 5 through 8 per cent per annum on a sustained basis from 1974. The full employment estimates in this study assume unemployment is maintained at 4 per cent a year. The employed labour force is assumed to increase at 2.7 per cent a year from 1973 to 1975. This rate of increase of the employed labour force is assumed to decline to 2.3 per cent a year from 1976 to 1980. The taxfiling population increases faster than the employed labour force due primarily to the rising propensity of young people and old people to file returns. In the estimates presented here, the taxfiling population increases by about 4.0 per cent a year from 1972 to 1975 and by 3.5 per cent a year in 1976, rising to 3.7 per cent a year by 1980.

The projected structure of the taxfiling population depends on the changing relative distribution of taxfilers by age, occupation and sex. Because the distribution of income and hence the revenue effects of any tax structure are sensitive to the size and composition of the taxfiling population, this study presents both the best possible estimate of the demographic pattern as well as general sensitivity tests of the results to alternative assumptions.

Another aspect of the economic environment which must be projected through time is the gradual shifting of the relative importance of various income sources in G.P.P. The revenue effects of any tax structure are sensitive to the size, composition and average level of different income streams. This study presents both the best estimate of the changing importance of the various income sources and a sensitivity test of the effects of alternative assumptions. The extrapolation technique used for both income streams and taxfilers is more fully outlined in Appendix A of this study. The sensitivity tests are described in Appendix B.

**Chapter Three****Indexing and Tax Incidence**

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## **Chapter Three**

# **Indexing and Tax Incidence**

### **3.1 Introduction**

Indexing the tax structure for inflation introduces an automatic reduction in personal income taxes which increases year-by-year and provides a measure of relief to all taxpayers whatever their income level. The results in this chapter show the average level of federal and Ontario income taxes before and after indexing as determined by the TISIM model. The results are classified into income groups according to current dollar income. Thus, as the gross income of each return in the sample varies as it is projected through time and in response to different rates of inflation, it is classified in the appropriate income group. Both inflation and the projected development of the economy contribute to alterations in the overall distribution of income.

For the comparisons in this chapter, it is assumed that inflation is sustained at 6 per cent per year to 1980. The first four tables show the average level of federal and Ontario taxes by income group under the unindexed and indexed systems. The average levels of federal and Ontario taxes for 1973 are also shown for comparison. In Table 3-5, the average reduction in federal and Ontario tax due to indexing is shown for 1974, 1975 and 1980. The combined federal and Ontario tax payable as a per cent of gross income is shown before and after indexing in Table 3-6 and the percentage reduction in combined tax payable due to indexing is shown in Table 3-7. The relative importance of bracket indexing versus exemption indexing in 1980 is shown in Table 3-8 and the characteristics of the taxfiling population are displayed in Table 3-9.

### **3.2 The Average Level of Personal Income Tax**

The average level of federal and Ontario taxes by income group with and without indexing of the personal income tax is shown in Tables 3-1 through 3-4. The method of projecting income and the taxfiling profile means that taxpayer will be assigned to different income groups each year as the average income of each tax return in the sample varies year by year. Thus, increases in average gross income within an income group, and hence average levels of taxes may more than offset such tax structure changes as the annual reduction in the bottom marginal rate of tax to 1976. For groups having up to \$6,000 gross

Table 3-1  
Average Federal Tax  
Unindexed

Gross Income	1973	1974	1975	1980
	\$	\$	\$	\$
less than \$1,000	0	0	0	0
\$ 1,000- 1,999	0	0	0	0
2,000- 2,999	13	7	5	4
3,000- 3,999	116	104	91	78
4,000- 4,999	270	260	246	225
5,000- 5,999	443	421	415	403
6,000- 7,999	691	699	697	711
8,000- 9,999	1,057	1,073	1,078	1,133
10,000- 11,999	1,455	1,465	1,484	1,560
12,000- 14,999	1,956	1,981	2,020	2,159
15,000- 19,999	2,782	2,853	2,934	3,257
20,000- 24,999	4,097	4,183	4,243	4,709
25,000- 34,999	5,953	6,127	6,250	6,816
35,000- 49,999	10,020	10,032	10,102	10,623
50,000- 74,999	16,920	17,118	17,376	17,706
75,000- 99,999	26,971	27,007	27,311	28,691
100,000-149,999	40,289	40,935	40,658	43,210
150,000-199,999	57,312	61,051	62,533	66,179
200,000-499,999	90,864	93,465	96,270	104,793
500,000 and over	165,284	188,728	212,316	281,213

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. Gross income is total income as reported for income tax purposes.
2. The tax before indexing includes taxation of the indexed Family Allowance payments, the increase in personal exemptions for 1973, the annual reduction in the bottom marginal rate and the 1973, 5% reduction in federal tax (\$100 minimum, \$500 maximum). U.I.C. premiums reflect the January, 1974 increase in premium rates.
3. For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter. The indexing factor is 6.6% in 1974 and as indicated by inflation thereafter.

Table 3-2  
Average Federal Tax  
Indexed

Gross Income	1973	1974	1975	1980
	\$	\$	\$	\$
less than \$1,000	0	0	0	0
\$ 1,000- 1,999	0	0	0	0
2,000- 2,999	13	4	1	0
3,000- 3,999	116	88	63	4
4,000- 4,999	270	236	201	73
5,000- 5,999	443	390	356	195
6,000- 7,999	691	663	628	456
8,000- 9,999	1,057	1,027	991	822
10,000- 11,999	1,455	1,405	1,373	1,185
12,000- 14,999	1,956	1,904	1,879	1,697
15,000- 19,999	2,782	2,738	2,721	2,543
20,000- 24,999	4,097	4,023	3,945	3,670
25,000- 34,999	5,953	5,940	5,902	5,544
35,000- 49,999	10,020	9,781	9,634	8,887
50,000- 74,999	16,920	16,749	16,688	15,258
75,000- 99,999	26,971	26,497	26,347	25,235
100,000-149,999	40,289	40,429	39,698	39,216
150,000-199,999	57,312	60,531	61,552	62,182
200,000-499,999	90,864	92,954	95,306	100,835
500,000 and over	165,284	188,207	211,329	277,276

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. The tax structure after indexing includes taxation of the indexed Family Allowance payments, the increase in personal exemptions for 1973, the annual reduction in the bottom marginal rate and the 1973, 5% reduction in federal tax (\$100 minimum, \$500 maximum). The indexed system allows for the indexing of personal exemptions and brackets.
2. For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.

Table 3-3  
**Average Ontario Tax**  
 Unindexed

Gross Income	1973	1974	1975	1980
	\$	\$	\$	\$
less than \$1,000	0	0	0	0
\$ 1,000- 1,999	1	0	0	0
2,000- 2,999	18	15	13	11
3,000- 3,999	60	56	51	47
4,000- 4,999	111	108	103	98
5,000- 5,999	165	159	157	153
6,000- 7,999	242	244	243	248
8,000- 9,999	354	358	360	376
10,000- 11,999	476	479	484	507
12,000- 14,999	632	639	652	695
15,000- 19,999	899	921	945	1,047
20,000- 24,999	1,330	1,354	1,370	1,514
25,000- 34,999	1,922	1,977	2,021	2,192
35,000- 49,999	3,210	3,218	3,238	3,399
50,000- 74,999	5,331	5,386	5,464	5,565
75,000- 99,999	8,408	8,425	8,513	8,913
100,000-149,999	12,504	12,695	12,604	13,346
150,000-199,999	17,745	18,863	19,301	20,383
200,000-499,999	28,149	28,902	29,716	32,224
500,000 and over	50,701	57,848	65,043	86,141

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. The Ontario tax rate is 30.5 per cent of basic federal tax.  
 2. For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.  
 3. Excludes the income tax rebates under the Ontario Tax Credit System.



Table 3-4  
Average Ontario Tax  
Indexed

Gross Income	1973	1974	1975	1980
	\$	\$	\$	\$
less than \$1,000	0	0	0	0
\$ 1,000- 1,999	1	0	0	0
2,000- 2,999	18	12	8	1
3,000- 3,999	60	50	40	11
4,000- 4,999	111	100	88	42
5,000- 5,999	165	149	138	84
6,000- 7,999	242	233	222	168
8,000- 9,999	354	344	333	281
10,000- 11,999	476	460	450	392
12,000- 14,999	632	615	607	549
15,000- 19,999	899	884	877	818
20,000- 24,999	1,330	1,302	1,274	1,181
25,000- 34,999	1,922	1,917	1,909	1,784
35,000- 49,999	3,210	3,140	3,092	2,857
50,000- 74,999	5,331	5,273	5,253	4,818
75,000- 99,999	8,408	8,269	8,219	7,859
100,000-149,999	12,504	12,541	12,311	12,128
150,000-199,999	17,745	18,704	19,002	19,164
200,000-499,999	28,149	28,746	29,422	31,017
500,000 and over	50,701	57,689	64,742	84,940

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. The Ontario tax rate is 30.5% of basic federal tax.  
 2. For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.  
 3. Excludes the income tax rebates under the Ontario Tax Credit System.

Table 3-5  
Average Reduction in Federal and  
Ontario Tax Due to Indexing

Gross Income	Federal			Ontario		
	1974 \$	1975 \$	1980 \$	1974 \$	1975 \$	1980 \$
less than \$1,000	0	0	0	0	0	0
\$ 1,000- 1,999	0	0	0	0	0	0
2,000- 2,999	4	5	4	3	5	11
3,000- 3,999	16	28	74	6	11	35
4,000- 4,999	24	45	153	8	15	56
5,000- 5,999	31	59	208	10	19	69
6,000- 7,999	36	69	256	11	21	80
8,000- 9,999	47	87	311	14	26	95
10,000- 11,999	60	111	375	18	34	115
12,000- 14,999	77	141	462	24	44	145
15,000- 19,999	115	213	714	37	68	229
20,000- 24,999	160	297	1,039	52	95	334
25,000- 34,999	187	348	1,272	60	112	408
35,000- 49,999	251	468	1,736	78	146	542
50,000- 74,999	370	689	2,448	113	210	747
75,000- 99,999	511	964	3,456	156	294	1,054
100,000-149,999	506	961	3,994	154	293	1,218
150,000-199,999	520	981	3,997	159	299	1,219
200,000-499,999	511	964	3,958	156	294	1,207
500,000 and over	521	987	3,937	159	301	1,201

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

Note: For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.

Table 3-6  
**Combined Federal and Ontario Income Tax  
as a Per Cent of Gross Income  
(Before and After Indexing)**

Gross Income	1974		1975		1980	
	Before (%)	After (%)	Before (%)	After (%)	Before (%)	After (%)
less than \$1,000	0	0	0	0	0	0
\$ 1,000- 1,999	0	0	0	0	0	0
2,000- 2,999	1	1	1	0	1	0
3,000- 3,999	5	4	4	3	4	0
4,000- 4,999	8	7	8	7	7	3
5,000- 5,999	11	10	10	9	10	5
6,000- 7,999	13	13	13	12	14	9
8,000- 9,999	16	15	16	15	17	12
10,000- 11,999	18	17	18	17	19	14
12,000- 14,999	20	19	20	19	21	18
15,000- 19,999	22	21	23	21	25	19
20,000- 24,999	25	24	25	24	28	22
25,000- 34,999	28	27	29	27	31	25
35,000- 49,999	33	32	33	31	35	29
50,000- 74,999	38	37	38	37	39	34
75,000- 99,999	41	41	42	41	44	40
100,000-149,999	45	44	45	44	47	43
150,000-199,999	46	46	48	47	51	48
200,000-499,999	45	45	47	46	51	49
500,000 and over	35	35	36	36	43	42

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

Notes: 1. For these comparisons, the inflation factor is 6.5% in 1973 and is sustained at 6% thereafter.

2. Incidence refers to total income tax burden as a percentage of gross income.

Table 3-7  
**Percentage Reduction in Combined Tax  
 Due to Indexing**

Gross Income	1974	1975	1980
	%	%	%
less than \$1,000	0	0	0
\$ 1,000- 1,999	0	0	0
2,000- 2,999	33	50	100
3,000- 3,999	15	27	89
4,000- 4,999	9	17	64
5,000- 5,999	7	13	49
6,000- 7,999	4	10	35
8,000- 9,999	4	8	27
10,000- 11,999	4	7	24
12,000- 14,999	4	7	21
15,000- 19,999	4	7	22
20,000- 24,999	4	7	22
25,000- 34,999	3	6	19
35,000- 49,999	3	5	17
50,000- 74,999	2	4	14
75,000- 99,999	2	3	12
100,000-149,999	1	2	9
150,000-199,999	1	2	6
200,000-499,999	1	1	4
500,000 and over	0	1	1

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

Notes: 1. For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.

2. Results based on incidence data in Table 3-7.

3. This is the combined burden of federal and provincial tax.

Table 3-8  
**Relative Importance of Bracket Indexing  
 Versus Exemption Indexing in 1980**  
 (Sustained 6% Inflation)

Gross Income	Average Tax Reduction		Exemption Effect as a % of Total Effect
	Exemption Indexing		
	Only	Full Indexing	
	\$	\$	%
less than \$1,000	0	0	0
\$ 1,000- 1,999	0	0	0
2,000- 2,999	15	15	100
3,000- 3,999	101	109	93
4,000- 4,999	181	209	87
5,000- 5,999	236	277	85
6,000- 7,999	272	335	81
8,000- 9,999	312	406	77
10,000- 11,999	348	490	71
12,000- 14,999	388	607	64
15,000- 19,999	506	943	54
20,000- 24,999	612	1,373	45
25,000- 34,999	673	1,680	40
35,000- 49,999	817	2,278	36
50,000- 74,999	927	3,195	29
75,000- 99,999	976	4,510	22
100,000-149,999	970	5,213	19
150,000-199,999	960	5,216	18
200,000-499,999	909	5,165	18
500,000 and over	882	5,138	17
Median	336	667	50

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

Note: For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.

Table 3-9  
**Characteristics of Ontario Taxfiling Population**

	1972	1973	1974	1975	1976	1977	1978	1979	1980
	(thousands)								
<i>Total Taxfilers</i>	4,128	4,290	4,443	4,620	4,781	4,949	5,124	5,307	5,501
<i>Taxable Filers</i>									
Unindexed									
—Federal	3,185	3,066	3,231	3,381	3,528	3,712	3,899	4,088	4,283
—Ontario	3,192	3,344	3,530	3,711	3,895	4,069	4,256	4,440	4,638
Indexed									
—Federal	3,185	3,066	3,177	3,286	3,371	3,489	3,605	3,726	3,859
—Ontario	3,192	3,344	3,473	3,599	3,718	3,836	3,959	4,085	4,213
<i>Number of Filers Removed From Tax Rolls due to Indexing</i>									
—Federal	0	0	54	95	157	223	294	362	424
—Ontario	0	0	57	112	177	233	295	355	425

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 tax records for residents of Ontario.

Notes: 1. The 5% reduction in federal tax (\$100 minimum, \$500 maximum) relieves a large numbers of filers from federal tax but not from Ontario tax under the Unindexed System.

2. For these comparisons, the inflation factor is 6.5% in 1973, sustained at 6% thereafter.

income, average federal taxes decline annually to 1980 under the system before indexing as shown in Table 3-1. The corresponding results for the average level of Ontario personal income taxes are shown in Table 3-2. The average levels of federal and Ontario tax after indexing are shown in Tables 3-3 and 3-4 for the years 1974, 1975 and 1980.

### 3.3 Tax Reduction Due to Indexing

The average reduction in federal and Ontario tax payable due to indexing is shown in Table 3-5. For returns classified between \$2,000 and \$3,000 gross income, the average size of the federal reduction is \$4 in 1974, \$5 in 1975 and \$4 in 1980. Here the effects of indexing are strongly influenced by the effects of the \$100 minimum federal tax reduction. By contrast, the average savings on Ontario income tax for filers within the \$2,000 and \$3,000 group increase year by year. The incidence of the tax system before and after indexing is shown in Table 3-6. Without indexing, the incidence of federal and Ontario tax rises through time for all income groups above \$6,000. With the introduction of indexing, tax burdens remain the same or fall for all income groups up to \$150,000.

The percentage reduction in combined federal and Ontario tax resulting from indexing is shown in Table 3-7. The percentage reduction due to indexing diminishes as gross income increases. For the filer with

between \$6,000 and \$8,000 gross income in 1974, the indexing reduction is 4%; in 1975 it is 10%, and in 1980, it is 35% of tax otherwise payable.

### **3.4 The Indexing Effects of Exemptions versus Brackets**

The relative importance of indexing exemptions only versus indexing exemptions and brackets simultaneously is shown in Table 3-8. At the lowest income group the exemption effect provides all of the tax reduction by 1980. In higher income brackets, the importance of the exemption effect by itself diminishes. Thus, at the macro-level the contribution of the exemption effect to the revenue loss due to indexing may be expected to diminish as average incomes increase. As Table 3-8 shows, the exemption effect in the aggregate accounts for about 50 per cent of the tax reduction in Ontario by 1980.

### **3.5 The Characteristics of the Taxfiling Population**

The characteristics of the taxfiling population are summarized for each year to 1980 in Table 3-9. This table shows the absolute number of filers projected for each year. This is expected to increase by about 4 per cent a year to 1975, then diminish to 3.5 per cent a year in 1976 and rise to about 3.7 per cent a year by 1980.

The table makes clear that the number of taxfilers will exceed the number of taxpayers without the introduction of indexing as well as with its incorporation in the tax structure. For example, in 1972 there were about 4.1 million taxfilers in Ontario of which about 3.2 million were liable to federal or Ontario income tax. When the 1973 returns are filed, it is expected there will be about 4.3 million in Ontario of which about 3.1 million will be liable to federal tax and 3.3 million subject to Ontario tax. The fact that there are almost 200,000 filers who pay Ontario income tax but no federal income tax is explained by the \$100 minimum tax reduction enacted by the federal government in 1973, which is not applied to the provincial share.

It should be noted that many returns on which no taxes are liable are filed to obtain rebates of taxes deducted at source and most of the no-tax returns will also contain claims for refundable amounts from the Ontario Tax Credit System.





**Appendix A****The Extrapolation of Incomes, Income Shares and the Taxfiling Population**

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## Appendix A

# The Extrapolation of Incomes, Income Shares and the Taxfiling Population

### A.1 Summary

The future revenue yield of the personal income tax in Ontario and the impact of indexing the tax structure for inflation are projected using an extrapolation of the growth and changing composition of both the taxfiling population and income shares to 1980. The method used to simulate the projected economic framework is similar to that used in Ontario Studies in Tax Reform 4, *Tax Reform and Revenue Growth to 1980*.<sup>14</sup> The updated and revised analysis used in the projection for the present study are fully outlined in the supplementary material.<sup>15</sup>

The two dimensions to the economic framework, the taxfiler and income projections, are developed independently. The number of taxfilers which each 1972 return is projected to represent is estimated independently of the growth in each income source attributable to a particular return. Thus, for example, wage and salary income in real terms grows at 5.6 per cent a year and the employed labour force at about 2.7 per cent a year, yielding just under 3 per cent increase in real income a year for each taxfiler characterized as a member of the labour force and receiving predominantly wage and salary income. As another example, the income of taxfilers on public pensions grows at the same rate as that of wage and salary income. However, the number of pensioner taxfilers increases more rapidly than the employed labour force so average real pension income increases more slowly than average real labour force income and in real terms, if not in money terms, may decline. As these examples illustrate, the resulting income increases for each tax return projected through time is a result of the independent interaction of the particular age, occupation and sex characteristics of the filer and the particular sources from which he derives his income.

### A.2 The Taxfiling Population

The allocation of occupations to the eight broad occupation categories used in the analysis is indicated in Appendix Table A.1. In 1972, tax returns of the military were treated for the first time as an integral

<sup>14</sup>Staff Paper, *Tax Reform and Revenue Growth to 1980*, *op. cit.*

<sup>15</sup>Nancy Bardecki, *The Extrapolation of Taxfilers and Income* Supplementary material to Ontario Tax Studies 9 (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1974), forthcoming.

Appendix Table A-1  
Occupation Definitions

Occupational Category	Occupations Included
Farmers and Fishermen	Farmers and Fishermen
Professionals	Accountants; Doctors; Lawyers and Notaries; Engineers; Architects; Entertainers, Artists; Nurses and Other
Business Proprietors	Foresters; Wholesale Trade, Retail Trade; Insurance Agents; Real Estate Agents; Manufacturing; Construction; Public Utilities; Recreational Services; Business Services, Other Services
Salesmen	Salesmen who report commission income from self-employment
Investors	Investors and Property Owners
Pensioners	Persons whose main source of income is government or company pension
Employees	Employees of Business Institutions; Federal, Provincial and Municipal Employees; Teachers and Professors; Unclassified Employees
Unclassified	Military; Estates; Those not elsewhere defined.

Source: *Taxation Statistics 1972* (Ottawa: Information Canada 1972) pp. 166-168.

Note: The occupational categories and the definitions of the occupations included are those used by the Department of National Revenue.

part of the taxfiling system. In this analysis, the military are classified in the residual, unclassified category. The increase in the size of the military in future years is totally at the discretion of the federal government and is not predictable on the basis of any previous behavioural pattern. Thus, the number of taxfilers in the military is assumed to increase at the general rate of increase in returns to ensure that the average income of this group will, at most, grow no more rapidly than that of members of the employed labour force. This ensures that the average increase in military incomes is not inflated in such a way as to bias upwards the revenue estimates of the analysis.

Each tax return analyzed for the revenue estimate is assigned to one of the 34 cells into which the taxfiling population is divided. The return is then increased to represent the number of returns in the target year, which produces the overall projected change in the size and composition of the taxfiling population.

The identity of each of the cells is given in Table A-2. The allocation of returns by Age, Occupation and Sex for the 1972 base year data and for the projections to 1975 and 1980 is given in Table A-3. Because the propensity to file returns by young people and the elderly is increasing, the proportion of returns attributable to members of the employed labour force declines although, with the increase in female labour force participation continuing, the decline is less marked for female employees.

Appendix Table A-2  
**Cell Classification of Taxfilers  
 By Age, Sex and Occupation**

Class	Age	Sex	Primary Occupation
1	Under 25	Male	All
2		Female	
3	Age 25-39	Male	Employee
4		Female	Employee
5		Both	Farmer
6		Male	Professional
7		Female	Professional
8		Both	Business Proprietor
9		Both	Salesman
10	Age 40-64	Male	Investor
11		Female	Investor
12		Male	Pensioner
13		Female	Pensioner
14		Male	Employee
15		Female	Employee
16		Both	Farmer
17		Male	Professional
18		Female	Professional
19		Both	Business Proprietor
20		Both	Salesman
21		Male	Investor
22		Female	Investor
23		Male	Pensioner
24	Female	Pensioner	
25	Age 65 and over	Male	Employee
26		Female	Employee
27		Both	Farmer
28		Both	Professional
29		Both	Business Proprietor
30		Both	Salesman
31		Both	Investor
32		Male	Pensioner
33		Female	Pensioner
34		General	General

Note: Cell 34 represents all ages and both sexes of the unclassified group. In 1972 and in following years, the military is included in this group.

### A.3 The Growth in Income and Changes in Income Shares

For each level of inflation to 1980 the size and relative shares of income sources must be reflected in the growth of each income type reported on the 1972 tax returns to project future incomes. The dollar amounts and relative share of each major income source are shown in Table A-4 for 6 per cent inflation sustained to 1980.

Appendix Table A-3  
**Numbers and Percentage of Filers in  
 1972, 1975 and 1980**

Class	Actual 1972		Projected 1975		Projected 1980	
	Number	% of Total Taxfilers	Number	% of Total Taxfilers	Number	% of Total Taxfilers
1	471,080	11.41	538,104	11.64	692,798	12.59
2	365,640	8.86	422,865	9.15	563,722	10.25
3	709,570	17.19	766,305	16.59	811,603	14.75
4	404,730	9.80	442,341	9.57	485,676	8.83
5	12,840	.31	13,796	.30	14,333	.26
6	8,110	.22	8,314	.18	8,784	.16
7	2,130	.05	2,249	.04	2,396	.04
8	37,850	.92	38,252	.83	36,865	.67
9	1,520	.04	1,672	.04	1,824	.03
10	3,280	.08	3,926	.08	4,896	.09
11	8,430	.20	10,199	.22	13,186	.23
12	60	—	84	—	134	—
13	200	—	283	—	470	—
14	738,040	17.88	789,997	17.10	855,381	15.55
15	437,790	10.60	474,023	10.26	530,983	9.65
16	43,860	1.06	46,680	1.01	49,379	.90
17	11,770	2.85	11,925	.26	12,881	.23
18	2,200	.05	2,287	.05	2,502	.04
19	74,340	1.80	74,342	1.61	73,091	1.33
20	5,320	.13	5,810	.12	6,442	.12
21	24,820	.60	29,398	.64	37,383	.68
22	56,020	1.36	67,211	1.45	88,545	1.61
23	14,170	.34	19,637	.42	32,086	.58
24	12,070	.29	16,928	.37	28,638	.52
25	41,200	1.00	50,595	1.09	69,078	1.25
26	9,630	.23	11,974	.26	16,926	.31
27	11,490	.27	14,016	.30	18,752	.34
28	2,150	.05	2,569	.05	3,451	.06
29	9,660	.23	11,139	.24	13,776	.25
30	780	.02	980	.02	1,370	.02
31	111,830	2.71	153,216	3.32	249,307	4.53
32	157,180	3.81	193,005	4.18	263,434	4.79
33	146,970	3.56	182,724	3.96	258,288	4.69
34	191,240	4.63	213,157	4.61	252,482	4.59
Total	4,127,970	100.00	4,620,003	100.00	5,500,862	100.00

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

The factors used to increase each income source on the sample tax returns are outlined in Table A-5. For example, all income from investment sources whether taxable dividend income or bond and bank interest is assumed to increase at the general rate for investment income and income from small business increases at the rate for small business income.

Appendix Table A-4  
**Amounts and Percentages of Income in Ontario  
 1972, 1975 and 1980**

Income Source	1972		1975		1980	
	(\$ Million)	(%)	(\$ Million)	(%)	(\$ Million)	(%)
Wage and Salary	34,555	81.69	49,734	82.34	88,587	83.46
Small Business	3,659	8.65	4,695	7.77	6,959	6.56
Investment	3,789	8.96	5,587	9.25	10,038	9.46
Farm	297	.70	381	.65	552	.52
TOTAL	42,300	100.00	60,397	100.00	106,136	100.00

Source: Extrapolations of Income using the Ontario Treasury Taxfiler and Income Simulation Model (XNTR).

- Notes: 1. The rate of inflation is assumed to be 6.6% in 1973 and sustained at 6% thereafter.  
 2. Real growth of GPP is assumed to be 7% in 1973 and sustained at 5.6% thereafter.  
 3. Real growth of farm income is assumed to be 3.89% in 1973 and sustained at 1.6% thereafter.  
 4. Sums may not add to totals due to rounding.

Appendix Table A-5  
**Allocation of Income Types**

Income Source	Source Classification
Wages and Salaries	1
Commission Paid by Employers	1
Other Earned Income	5
Income from Small Business	2
Net Professional Income	1
Net Farm Income	4
Net Rental Income	3
Unemployment Insurance Benefit	1
Old Age Pension	1
Private Pension Income	3
Public Pension Income	1
Taxable Dividend Income	3
Bond Interest	3
Bank Interest	3
Mortgage Interest	3
Trust Company Income	3
Annuity Income	3
Investment Income	3
Capital Gains	3
Foreign Investment Income	3
Other Income	5

Note:

<i>Income Source Classifications</i>	
Wages and Salaries	1
Small Business Income	2
Investment Income	3
Farm Income	4
General	5

**Appendix B**

**The Sensitivity of the Revenue Estimates to Alternative Assumptions**

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## Appendix B

### The Sensitivity of the Revenue Estimates to Alternative Assumptions

Sensitivity tests of the revenue estimates to alternative sets of assumptions about taxfiler growth and the pattern of change of income shares are presented here. The results in the main text represent the best estimates but it is important to ascertain how much difference would be made in the results by more simple and extreme assumptions.

The sensitivity tests are conducted for 1980, thereby giving the alternative economic assumptions some scope to work themselves

Appendix Table B-1  
Sensitivity Analysis of  
Projections in Ontario  
1980

Assumption	Federal Revenue (\$ Million)	Ontario Revenue (\$ Million)	Total (\$ Million)
A	11,161	3,608	14,770
B	11,044	3,571	14,615
C	11,151	3,603	14,754
D	10,900	3,525	14,424

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

The growth factors for the demographic groups and income components are derived from Nancy Bardecki, "The Extrapolation of Taxfilers and Income Model" (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1974), forthcoming.

- Notes: 1. Assumption A refers to the standard assumptions for the study; both income components and the demographic groups of taxfilers grow at variable rates. Assumption B refers to the case where income components grow at variable rates, and the number of taxfilers in all demographic groups grow at the general rate. Assumption C refers to the case where income components grow at variable rates and the number of taxfilers increase at the rate of growth of the employed labour force. Assumption D refers to the case where all income components grow at the same rate and the demographic groups of taxfilers grow at variable rates.
2. The revenues shown are after indexing and inflation to 1980 is assumed to be 6 per cent.



Appendix Table B-2  
Sensitivity Analysis of Distribution of Taxfilers in Ontario  
1980

Class	A		B		C	
	Number	(%)	Number	(%)	Number	(%)
1	692,798	12.59	592,928	11.40	576,683	11.40
2	563,722	10.25	466,147	8.97	447,557	8.97
3	811,603	14.75	893,648	17.19	868,010	17.19
4	485,676	8.83	509,424	9.80	495,353	9.80
5	14,333	.26	18,212	.31	15,677	.31
6	8,784	.16	10,339	.20	9,839	.20
7	2,396	.04	2,687	.05	2,605	.05
8	36,865	.67	47,729	.92	46,243	.91
9	1,824	.03	1,916	.04	1,855	.04
10	4,896	.09	4,146	.08	4,002	.08
11	13,186	.23	10,627	.20	10,306	.20
12	134	—	76	—	73	—
13	470	—	252	—	245	—
14	855,381	15.55	930,490	17.90	902,169	17.90
15	530,983	9.65	551,118	10.60	535,755	10.60
16	49,379	.90	56,336	1.08	53,585	1.08
17	12,881	.23	15,899	.30	14,233	.30
18	2,502	.04	2,778	.05	2,686	.05
19	73,091	1.33	93,763	1.80	90,795	1.80
20	6,442	.12	8,710	.17	6,495	.17
21	37,383	.68	31,346	.60	30,296	.60
22	88,545	1.61	70,616	1.36	68,488	1.36
23	32,086	.58	17,843	.34	17,342	.34
24	28,638	.52	15,192	.29	14,774	.29
25	69,078	1.25	51,914	1.00	50,386	1.00
26	16,926	.31	12,128	.23	11,780	.23
27	18,752	.34	14,482	.28	14,044	.28
28	3,451	.06	2,734	.05	2,613	.05
29	13,776	.25	12,184	.23	11,798	.23
30	1,370	.02	984	.02	953	.02
31	249,307	4.53	141,025	2.71	136,678	2.71
32	263,434	4.79	197,794	3.80	192,388	3.80
33	258,268	4.69	184,899	3.56	179,917	3.56
34	252,482	4.59	240,664	4.63	234,090	4.63
Total	5,500,862	100.00	5,199,230	100.00	5,049,613	100.00

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for residents of Ontario.

- Notes: 1. Assumption A refers to the standard case.  
 2. Assumption B refers to the case where the various demographic cells of taxfilers increase at the general growth rate of income taxfilers.  
 3. Assumption C refers to the case where the various demographic cells of taxfilers increase at the rate of growth of the employed labour force.

through the system. The revenue yield of the personal income tax in Ontario is shown after indexing in Table B-1 for the standard assumptions of the study and the alternative test assumptions.

In Assumption Set B, the number of taxfilers in whatever Age, Occupation and Sex cell are assumed to increase at the general rate of increase for all returns. This assumption tends to distort upwards the number of filers who are in the employee category as well as some other groups, such as farmers. It distorts downwards the number of pensioners, the number of young people and the number of investors. Because of the linear nature of the blowup factors, the total number of filers in the standard assumption is somewhat greater than is produced by a uniform application of the general rate of increase of filers. The indexed tax revenue yield is less in this test than in the standard assumption because the fixed total of employment income must be spread among more employees leading to a smaller average increase in employee income than in the standard analysis.

In Assumption Set C, the number of taxfilers increases at the rate of increase of the employed labour force. This is a slower rate of growth than the general growth factor. Under this assumption the number of pensioners and low income young people is even further underestimated than in Assumption Set B, but average employee income grows faster than under Set B and hence the revenue yield of the indexed system is larger than under Set B.

In Assumption Set D, the demographic characteristics are kept as for the standard assumption but income sources are all taken to increase at a uniform rate. Investment income thus increases more slowly than under the standard assumptions and the revenue yield of the indexed system is smaller than for either of the other sets of alternative assumptions.

Thus, the standard assumptions in this analysis produce a larger revenue yield from the indexed system than would any simple but plausible alternative. The estimates of the study may therefore be regarded as an optimistic estimate of the yield of the personal income tax after indexing for inflation.

**Appendix C**

**Elasticities of the Federal and Ontario P.I.T. Revenues Before  
and After Indexing**

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## Appendix C

### Elasticities of the Federal and Ontario P.I.T. Revenues Before and After Indexing

The percentage increase in the federal and Ontario personal income tax revenues in Ontario normalized by the percentage increase in gross income reported for tax purposes yields estimates of the federal and Ontario revenue elasticities before and after indexing the tax system.

The elasticity of federal revenues before indexing ranges from 1.53 to 1.61 at 5 per cent and 8 per cent inflation respectively for 1974

Appendix Table C-1  
Elasticity of Federal Revenue With Respect to Gross Income

Inflation Rate	5%	6%	7%	8%
<i>1974/73</i>				
Unindexed	1.53	1.56	1.59	1.61
Indexed	1.15	1.21	1.26	1.30
<i>1975/74</i>				
Unindexed	1.53	1.55	1.58	1.60
Indexed	1.22	1.24	1.24	1.25
<i>1976/75</i>				
Unindexed	1.54	1.56	1.57	1.59
Indexed	1.22	1.21	1.20	1.20
<i>1977/76</i>				
Unindexed	1.60	1.61	1.61	1.62
Indexed	1.32	1.31	1.30	1.28
<i>1978/77</i>				
Unindexed	1.57	1.57	1.57	1.60
Indexed	1.31	1.28	1.27	1.25
<i>1979/78</i>				
Unindexed	1.54	1.54	1.54	1.53
Indexed	1.29	1.28	1.26	1.25
<i>1980/79</i>				
Unindexed	1.53	1.52	1.51	1.51
Indexed	1.31	1.28	1.27	1.25

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for Ontario.

Note: The revenue elasticity for 1973/72, before indexing came into effect, is .88. This low elasticity is primarily a consequence of the increase in the federal tax reduction for 1973 from 3 to 5 per cent.

Appendix Table C-2

**Elasticity of Provincial Revenue With Respect to Gross Income**

Inflation Rate	5%	6%	7%	8%
<i>1974/73</i>				
Unindexed	1.46	1.49	1.52	1.54
Indexed	1.10	1.15	1.20	1.24
<i>1975/74</i>				
Unindexed	1.47	1.49	1.51	1.53
Indexed	1.17	1.19	1.19	1.20
<i>1976/75</i>				
Unindexed	1.48	1.50	1.52	1.54
Indexed	1.18	1.16	1.16	1.16
<i>1977/76</i>				
Unindexed	1.56	1.57	1.57	1.58
Indexed	1.28	1.27	1.26	1.24
<i>1978/77</i>				
Unindexed	1.53	1.53	1.54	1.53
Indexed	1.27	1.25	1.24	1.22
<i>1979/78</i>				
Unindexed	1.51	1.51	1.51	1.51
Indexed	1.26	1.25	1.23	1.22
<i>1980/79</i>				
Unindexed	1.50	1.49	1.49	1.48
Indexed	1.29	1.26	1.25	1.23

Source: *Ontario Treasury* computer analysis of the preliminary sample of 1972 income tax records for Ontario.

Note: The revenue elasticity for 1973/72, before indexing came into effect, is 1.33.

revenues over 1973. After indexing, this drops to 1.15 and 1.30 at 5 per cent and 8 per cent inflation respectively. The elasticity of the federal system before indexing reaches a peak in 1977 at whatever inflation rate, and begins to decline again after that. After indexing, the elasticity seems to reach a trough in 1976, peak in 1977 and remain more stable thereafter. The low 1973 elasticity reported in the footnote is partly due to the increase in the federal tax reduction from 3 per cent to 5 per cent and partly due to the low level of 1973 inflation assumed in these estimates.

The elasticity of Ontario revenues is uniformly lower than that of the federal government both before and after indexing in all years except 1973. In 1974, before indexing, the elasticity ranges from 1.46 to 1.54 at 5 per cent and 8 per cent inflation respectively. This declines to 1.10 and 1.24 for these two levels of inflation after indexing. The range in the difference of elasticities at various rates of inflation is about the same for Ontario revenues as it is for federal.



**Appendix D**

**Revenue Losses From Indexing in Seven Other Provinces**

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## Appendix D

### Revenue Losses From Indexing in Seven Other Provinces

In co-operation with the other provinces, Ontario's simulation techniques have been applied to the 1972 tax base of seven provinces to estimate the indexing losses in these provinces during the period of the federal revenue guarantee. The estimates for the other provinces assume the projected changes of the Ontario economy apply to the actual characteristics of the taxfiling population for each of the other provinces. Thus, the revenue estimates for all the provinces are made within a consistent economic framework.

The chief result of this analysis is that the Ontario experience with the simulated effects of indexing applies generally for all provinces with tax collection agreements. Micro-simulation of the revenue structures of other provinces confirms the results obtained for Ontario. It also shows that the indexing losses will be relatively greater in the low income provinces.

Appendix Table D-1  
Decrease in Federal Income Tax Revenues by Province  
Due to Indexing  
(Sustained 6% Inflation)

Province	1974 (%)	1975 (%)	1976 (%)	1977 (%)
Newfoundland	5.4	9.5	13.7	16.9
New Brunswick	5.2	9.2	13.2	16.3
Nova Scotia	5.0	8.8	12.7	15.8
Ontario	4.0	7.2	10.5	13.2
Manitoba	4.6	8.1	11.7	14.7
Saskatchewan	5.0	8.9	12.8	16.0
Alberta	4.3	7.7	11.2	14.0
British Columbia	3.8	6.7	9.8	12.4

Source: Computer analysis of the sample of 1972 income tax records for each of the above provinces.

Note: The extrapolation assumptions used for each of the provinces are the same as those for Ontario. It is assumed that inflation is 6.5% in 1973, sustained at 6% to 1977.



The provincial results show that the smallest proportional reduction in revenues occurs in British Columbia and the largest in Newfoundland. By 1978, the cumulative reduction is 12 per cent in British Columbia and 17 per cent in Newfoundland with the effects on the other provinces lying between these two extremes. The estimates are made with the assumption of a uniform 6 per cent level of inflation in all provinces.





